

bristles of both ninth and tenth segments long; a dorsal series of minor setæ on 9 and a dorsal pair on 10; the latter segment divided above.

*Type.* Hope Department of Zoology, University Museum, Oxford.

*Hab.* N. QUEENSLAND, Brandon; on a composite flower (? *Helianthus* sp.), 16. x. 14 (R. Kelly).

Near *P. glaucus*, Bagn. (a South-African species), from which it may be separated, apart from coloration, by the fewer setæ on veins of fore-wings and the chaetotaxy of the apical abdominal segments.

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XIX.—*The Nematode Genus Tanqua*, R. Blanchard.

By H. A. BAYLIS, B.A.

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UP to the present time only a single species of this remarkable genus appears to have been recognized, viz. the interesting form *Tanqua tiara* (v. Linst.). This is a nematode of medium size, somewhat resembling an *Ascaris* in general build, and inhabiting the stomach and intestines of reptiles of more or less aquatic habits. It was first recorded, under the name of *Ascaris tiara*, by von Linstow (1879), from "*Varanus ornatus*" (? *V. albigularis* \*) in Natal. The other hosts and localities from which it has been recorded in published papers are:—*Varanus salvator*, Sumatra (Parona, 1898); *V. gouldii*, Australia or New Guinea—precise locality unknown (Parona, 1898); *V. bengalensis*, Ceylon (von Linstow, 1904); and *V. niloticus*, White Nile (Leiper, 1908). Leiper also mentions the occurrence of a very similar form in *Hydrosaurus bivittatus* from the Federated Malay States.

I have now to add that I have examined specimens, which I believe to belong to this species, (1) from a lizard (probably *Varanus niloticus*, though I have no information regarding its determination), from Accra, Gold Coast Colony; (2) from *Tropidonotus quincunciatus* (*T. asperrimus*, Blgr.†), from Ceylon; and (3) from *Varanus exanthematicus*, Northern

\* Dr. G. A. Boulenger informs me that *V. albigularis* is the form most nearly related to *V. ornatus*, occurring in Natal.

† Dr. Boulenger regards the Ceylon form of *T. quincunciatus* as a distinct species.

Nigeria. The last-mentioned specimens were kindly given to me, for the purpose of comparison, by Dr. J. H. Ashworth, of Edinburgh, who informed me that they had been determined as *T. tiara* by Dr. R. T. Leiper\*.

It would appear, from this list of hosts, that *T. tiara* is not confined to the monitors (*Varanus*), but may also infect snakes of semi-aquatic habits. That the genus, at all events, certainly does so is shown by some specimens which recently came to light in the British Museum collection. Having occasion to examine the types of Baird's species *Ascaris obconica*, from the Brazilian fresh-water snake *Helicops [Uranops] angulatus*, I was struck by the fact that some of the specimens so labelled were distinctly smaller than others, and of a different shape, especially in the region of the tail. A closer examination soon showed that these smaller specimens undoubtedly represented a species of *Tanqua*. They have a very close resemblance in all respects to the type-species, but differ sufficiently from it, especially when the geographical distribution is taken into account, to be regarded as representing a distinct species.

The genus *Tanqua*, as has been pointed out by Leiper (1908), possesses certain features which indicate a close relationship with *Gnathostoma*, Owen. He places it provisionally in the family Gnathostomidæ, and there seems to be no objection at present to this classification.

### 1. *Tanqua tiara* † (v. Linst.).

*Ascaris tiara*, von Linstow, 1879, p. 320; Parona, 1898, p. 114.

*Ctenocephalus tiara*, von Linstow, 1904, p. 102; Pl. ii. figs. 23-27.

*Tanqua tiara*, R. Blanchard, 1904, p. 478; Leiper, 1908, p. 189.

Von Linstow has given (1904) a fairly complete and accurate account of this species; his figures, however, are somewhat too diagrammatic, and calculated to be misleading. There are one or two points in which, after examining a number of specimens, I must differ from him. He states (1904, p. 102) that the dorsal lip has three rounded projections, while the ventral lip has four similar processes, interdigitating. In a cleared specimen, viewed in horizontal optical section, it might quite easily be imagined that this was a correct interpretation of the structure. By rolling the specimen over, however, under a cover-glass, in such a way that first one lip and then the other can be focussed separately,

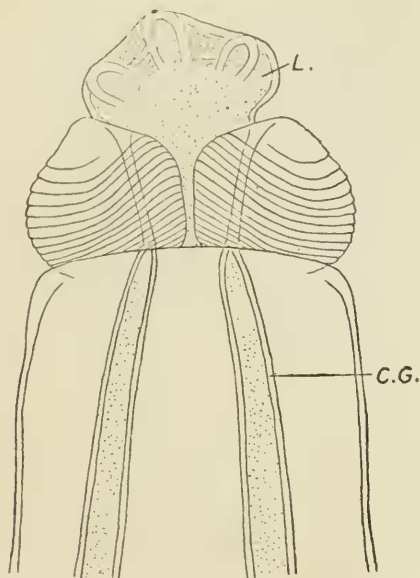
\* Since writing this paper, I have received several further examples of *T. tiara* from a species of *Varanus* in Zanzibar.

† For generic and specific diagnoses see below (p. 230).

it becomes apparent that each lip has in reality only three "teeth" on its anterior border. The anterior lobe of each lip (fig. 1, *L.*), which carries the teeth, is twisted slightly to one side, in such a way that its teeth can interlock with those of the other lip. The teeth of each lip are, in fact, asymmetrically disposed with regard to the longitudinal axis of the animal. The "teeth" are, in reality, folds of thickened cuticle, and are shown in optical section in fig. 1.

Von Linstow is, I think, in error in stating that the two

Fig. 1.



*Tanqua tiara*. Head of an example from *Varanus exanthematicus*.

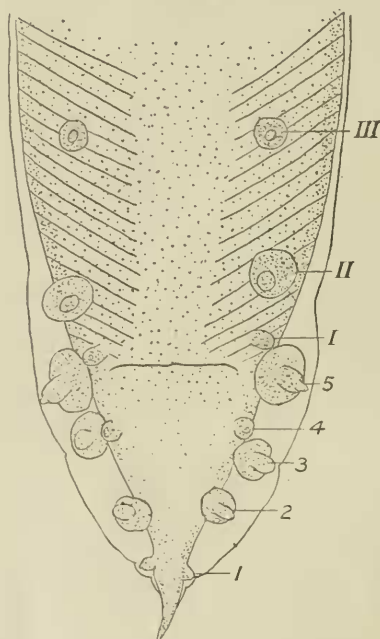
*C.G.*, cervical gland; *L.*, lip.

cervical glands on either side unite anteriorly to form a common duct; the duct of each gland appears to open separately upon the anterior surface of one of the four striated swellings at the base of the lips.

Another point in which von Linstow's account seems inaccurate is the number of papillæ on the tail of the male. He mentions and figures (1904) two preanal, one large paranal, and three postanal pairs of papillæ. In the specimens which I have examined there are two additional pairs

of smaller papillæ—one (fig. 2, *I*) just in front of, and slightly ventral to, the large paranal pair, and another (fig. 2, *4*) in a similar position on the body, between the paranals and the most anterior of the large postanals. There are thus, in all, eight pairs of papillæ, four pairs being postanal, one paranal, and three preanal. The first postanal papillæ (nearest to the tip of the tail) are very small, laterally

Fig. 2.



*Tanqua tiara*. Ventral view of posterior end of a male from *Tropidonotus asperrimus*.

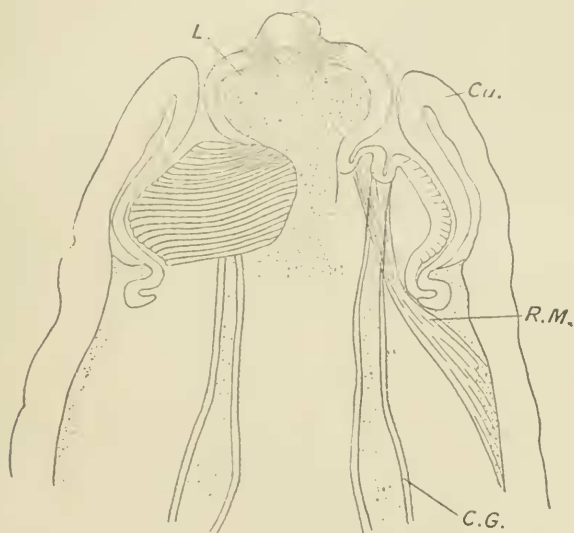
1-4, postanal papillæ ; 5, paranal ; I-III, preanal papillæ.

placed, and simple in structure. The second and third postanal, the paranal, and the second and third preanal papillæ on each side are very laterally placed, and are of a peculiar and characteristic shape. They are elongate, finger-like papillæ, having a large swelling at about the middle of their length, beyond which they again suddenly become narrow and tapering, before coming to the surface of the cuticle.

The spicules of the male are characterized by a peculiar rasp-like covering of minute points or spinelets throughout their length—a fact which the previous observers have omitted to mention.

In other respects the specimens which I assign to this species agree well with von Linstow's account (1904). A table, showing in parallel series the measurements of certain parts of the body in the various sets of specimens studied and, for comparison, the measurements given by von Linstow, will be found on p. 231.

Fig. 3.



*Tanqua diadema*. Head of an example from *Helicops angulatus*.  
The right half is shown partly in optical section.

C.G., cervical gland; Cu., fold of cuticle; L., lip; R.M., retractor muscles of head.

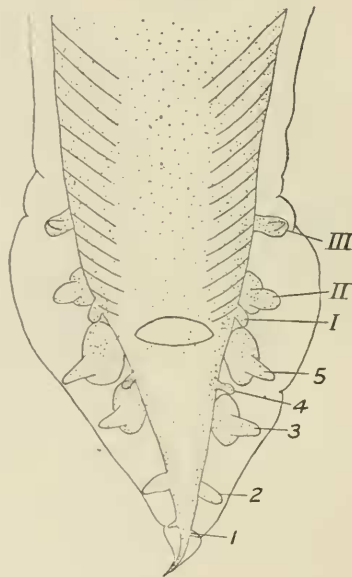
## 2. *Tanqua diadema*, sp. n.

The following is an account of the second form, which, as mentioned above, was discovered among the type-specimens of *Ascaris obconica*, Baird, from the intestines of the South-American fresh-water snake *Helicops angulatus*.

The male measures about 20 mm. in length and 0.6 mm. in thickness. The female is larger, 28-30 mm. long and

0·8–1 mm. thick. The head (fig. 3) is similar in shape to that of *T. tiara*, but appears to be retractile within a protective sheath of loose cuticle, and to be provided with special retractor muscles for that purpose. The swollen basal portions of the head are transversely striated, as in the type-species, and the two lips (*L.*) are closely similar to those of *T. tiara*, each being provided with three blunt teeth, and twisted sideways in such a way that the teeth of the opposite lips interlock. The head measures in length (from base of

Fig. 4.



*Tanqua diadema*. Ventral view of posterior end of a male from *Helicops angulatus*.

Papillæ numbered as in fig. 2.

striated portion to end of middle tooth) 0·22 mm.; the maximum width of the basal portion is 0·25 mm., and that of the lips 0·18 mm.

Four elongate cervical glands (fig. 3, *C.G.*) are present, opening on to the basal portion of the head, as in *T. tiara*. The length of the œsophagus is only 2·2 mm. (male)–2·4 mm. (female). It thus varies between about  $\frac{1}{11}$  and  $\frac{1}{9}$  of the total length. This is an important point of difference from the

type-species, in which the œsophagus is about twice as long, being sometimes as much as  $\frac{1}{4}$  (or even more, according to von Linstow), and never less than  $\frac{1}{7}$ , of the total length.

The tail of the male (fig. 4) is 0.6 mm. long, or about  $\frac{1}{33}$  of the total length. There is a considerable lateral expansion of the cuticle, forming a bursal ala on either side, so that the outline of the tail is somewhat like an arrow-head with rounded barbs. The two spicules measure 1.4 mm. in length (or 1.1 mm. in a straight line from base to tip). They are covered with minute spinelets, as in the preceding species. The papillæ are arranged precisely as in *T. tiara*, and are present to the same number (eight pairs). The only important difference observed is that the second postanal pair (*i. e.*, the second from the extremity of the tail) lack the large swelling, or exhibit it in a much less conspicuous degree.

In the female the tail measures 0.65 mm. in length, or about  $\frac{1}{43}$  of the total length. It tapers rapidly from the anus, and ends in a sharp point. The vulva is situated considerably further forward than in the type-species, and is within the middle third of the body; in a mature example it opens at 11.5 mm. from the posterior end, thus dividing the body in the proportion of 33:23. The vagina is short. One branch of the uterus, with its ovary, lies anteriorly to it, the other posteriorly. The eggs are similar to those of *T. tiara* in shape, measuring 60  $\mu$  in length and 42.5  $\mu$  in breadth.

### 3. *Tanqua anomala* (v. Linst.).

*Heterakis anomala*, von Linstow, 1904, p. 97; Pl. i. figs. 10, 11.

Under this name, in the same paper with *T. [Ctenocephalus] tiara*, von Linstow has described a form from the stomach of *Tropidonotus piscator* in Ceylon, which appears almost certainly to belong to the genus under consideration, and not to *Heterakis*. There are certain apparent discrepancies, which might, perhaps, be removed or explained by a re-examination of the material. Thus the lips are described as being three, instead of two, in number, and there is said to be a peculiar preanal sucker-like organ in the male, "beset with eight roundish projections, of which the cuticle shows pore canals." But in all other respects the species seems to agree very well with the two forms already considered in this paper. The figures given by von Linstow at once suggest *Tanqua*, on account of (1) the general shape of the head, and the presence of striated cuticular swellings at its base; (2) the characteristic shape of some of the caudal papillæ of the male; and (3) the equal length and spiny or



granulated appearance of the spicules. These points are all borne out by the description; from its larger size, however, and certain differences in the arrangement of the papillæ, and in the proportions of various parts of the body, it is evident that the species is distinct from both *T. tiara* and *T. diadema*.

From the features of the type-species, *T. tiara*, and that now described as *T. diadema*, it is possible to extract some characters which may be regarded as being of generic value, and a revised definition of the genus may be given, somewhat as follows:—

TANQUA, R. Blanchard, 1904.

[= *Ctenocephalus*, v. Linst., 1904.]

Gnathostomidæ: of medium size, moderately stout in proportion to the length of the body. Head provided with two lips, dorsal and ventral, each bearing on its inner side three rounded tooth-like projections. At the base of the head there are four rounded submedian cuticular swellings, marked with distinct transverse striations. Anteriorly the lips are twisted slightly out of the middle line, towards opposite sides, in such a way that the teeth of one lip can be interlocked with those of the other lip. Cuticle thick, with irregular transverse wrinkles and exceedingly fine transverse striations. The cuticle of the anterior end may be loose and form a protective sheath, within which the head can be retracted. Œsophagus rather long, simple in structure, increasing gradually in diameter from before backwards. No œsophageal bulb, œsophageal or intestinal diverticula. Four elongate cervical glands present, opening to the exterior on the basal portion of the head. Tail of male provided with more or less pronounced lateral alæ near the tip, giving it a lancet-shaped outline, and having eight pairs of elongate papillæ of different sizes, some of which have a characteristic swelling near the middle. Copulatory spicules curved, cylindrical, and armed throughout with minute spines. Posterior end of the body, in the male, provided with a series of oblique muscle-bands on either side of the ventral surface, extending for some distance in front of the anus. Tail of female short, tapering and pointed. Vulva in the posterior half of the body. Vagina rather short, with a coat of circular muscles; giving off two wide uterine branches, one of which, with its ovary, lies anteriorly, the other posteriorly, to the vagina. Eggs oval, with thin shells, ornamented with fine granulations.

Type-species, *T. tiara* (v. Linst.), 1879.



Comparative Table of Measurements in Tanqua tiara, T. diadema, and T. anomala (v. Linst.).  
(All measurements in millimetres.)

	Tanqua tiara.				T. diadema.	T. anomala.
	Host:— (von Linstow, 1904)	Tarannus sp. ♀ (Gold Coast).	Tarannus exanthematicus*.	Tropidonotus aspertrinus.	Helicops angulatus.	Tropidonotus piscator.
Length, ♂	18-20	20	20	25	20	34
" "	25-28	27	26	35	28-30	33
Thickness, ♂	0.63-1	0.7	0.55-0.6	0.65	0.6	1.14
" "	1.2-1.3	0.95	0.9-1	1.1	0.8-1	1.14
Head—length	.....	0.27-0.33	0.18-0.28	0.22-0.3	0.22	.....
" width, base	.....	0.4-0.5	0.25-0.41	0.3-0.39	0.25	.....
Lips, width	.....	0.21-0.26	0.15-0.22	0.17	0.18	.....
(Esophagus—length	.....	4-5	4.3-5	3.65-4.86	2.2-2.4	.....
" fraction of total	.....	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{4}$	$\frac{1}{11}$	.....
length	$\frac{1}{4}-\frac{1}{3}$	0.55	0.4	0.6	0.6	$\frac{1}{9}-\frac{1}{6}$
Tail, ♂—length	.....	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{4}$	$\frac{1}{3}$	.....
" fraction of total length	$\frac{1}{3}-\frac{1}{5}$	0.6	0.6	0.8	0.65	$\frac{1}{4}$
(approximate)	.....	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{4}$	$\frac{1}{3}$	.....
♀—length	.....	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{8}$
" fraction of total length	$\frac{1}{6}$	5.9	5.5-4	4.6	11.5	.....
(approximate)	.....	7.2	21.5	4.1	33.23	2.1
Vulva—distance from post. end,	50:11	0.064 × 0.0375	0.065 × 0.042	0.062 × 0.045	0.060 × 0.0425	0.055 × 0.036
" divides body in proportion of	.....	.....	.....	.....	.....	.....
Egg—measurements	.....	.....	.....	.....	.....	.....

\* These examples were not fully mature, and the females contained no fully-formed eggs.

The two species which can at present be assigned definitely to this genus may be distinguished thus:—

1. Head not retractile within a cuticular sheath. Œsophagus long (one-seventh to one-fourth of the total length). Vulva situated within the last quarter of the total length. Parasitic in *Varanus* and other semi-aquatic reptiles in Africa, the East Indies, and Australasia . . . . *T. tiara* (v. Linst.).
2. Head retractile within a loose cuticular sheath. Œsophagus comparatively short (about one-eleventh of the total length). Vulva in the middle third of the body. Parasitic in semi-aquatic reptiles in South America . . . . . *T. diadema*.

A table of measurements is given on p. 231, including, for the sake of completeness, these two species and the more doubtful *T. anomala*. The measurements given by von Linstow (1904) for *T. tiara* are placed beside my own for comparison. A certain amount of variation was found to exist, and for this reason measurements derived from the three sets of specimens studied are given side by side.

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XX.—*Preliminary Notice of some Irish Sponges.—The Monaxonellida (Suborder Sigmatomonaxonellida) obtained by the Fisheries Branch of the Department of Agriculture and Technical Instruction, Ireland.* By JANE STEPHENS, B.A., B.Sc., Irish National Museum.

THE following list of sponges belonging to the suborder Sigmatomonaxonellida, Dendy, contains ninety-five species. Fifty-one of the species are now recorded for the first time within the Irish area, and of these thirty-one have not been taken previously off any part of the British Isles.

Thirteen species are described as new.